

CUSTOMER NO.: 24498

Serial No.: 10/043,700

FINAL Office Action dated: October 12, 2005

Response dated: November 21, 2005

PATENT

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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

1. (Currently Amended) A multi-mode bi-directional communications device, comprising:

a diplexer having a high-pass filter, a low-pass filter; and

a digitally operable switch, connected in signal communication with the low-pass filter, responsive to signals from a microprocessor; and

a resonator-free, non-resonator-actuated notch filter selectively coupled to the low-pass filter by the digitally operable switch in response to indicium of a desired spectral region.

2. (Original) The device of claim 1, further comprising upstream processing circuitry and downstream processing circuitry coupled to said diplexer.

3. (Previously Presented) The device of claim 2, wherein the downstream processing circuitry comprises:

a tuner;

a demodulator;

a first surface acoustic wave (SAW) filter selectively coupled between said tuner and said demodulator; and

a second SAW filter selectively coupled between said tuner and said demodulator.

4. (Original) The device of claim 3, wherein the first SAW filter has a bandwidth of 6MHz and the second SAW filter has a bandwidth of 8MHz.

5. (Original) The device of claim 3, further comprising at least one selector for selectively coupling the first SAW filter and the second SAW filter between the tuner and the demodulator.

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6. (Original) The device of claim 3, wherein said high-pass filter is coupled to said tuner.

7. (Original) The device of claim 1, wherein said high-pass filter passes signals greater than 88MHz.

8. (Currently Amended) The device of claim 2, wherein said upstream processing circuitry is selectively coupled to one of said low-pass filter and said low-pass filter in conjunction with said ~~resonator-free, non-resonator-actuated~~ notch filter.

9. (Currently Amended) The device of claim 1, wherein the low-pass filter nominally passes signals less than 65MHz, and passes signals less than 42MHz when the ~~resonator-free, non-resonator-actuated~~ notch filter is coupled thereto.

10. (Cancelled)

11. (Currently Amended) The device of claim 10 1, wherein the ~~at least one digitally operable~~ switch is selected from a group consisting of a transistor, and a PIN diode, ~~a diode, and an electro-mechanical switch~~.

12. (Previously Presented) The device of claim 1, wherein said device is selected from a group comprising a cable modem and a satellite terminal.

13. (Original) The device of claim 1, wherein said device supports multiple standards selected from the group consisting of the North American Data Over Cable Service Interface Specifications (DOCSIS) or the European DOCSIS standards.

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14. (Currently Amended) A diplexer, comprising:

a high-pass filter coupled between a first signal port and a second signal port;
a low-pass filter coupled between a first signal port and a third signal port; and
a digitally operable switch, connected in signal communication with said low-pass
filter, responsive to signals from a microprocessor; and
a resonator free, non-resonator actuated notch filter, selectively coupled to the low-
pass filter by the digitally operable switch in response to indicium of a desired spectral
region.

15. (Currently Amended) The diplexer of claim 14, wherein said low-pass filter comprises:

a first plurality of inductors connected in series between said first and third signal ports, each of said first plurality of inductors being coupled to ground via a respective capacitor forming thereby a plurality of single pole filter elements, a portion of said first plurality of inductors being bypassed by respective capacitors, the portion consisting of any of the first plurality of inductors which are connected to ~~said resonator free, non-resonator actuated notch filter~~ via the respective capacitor; and

~~said resonator free, non-resonator actuated notch filter~~ comprises:

a second plurality of inductors, where each inductor is respectively coupled between a portion of the capacitors of the single pole filter elements of the low-pass filter and ground.

16. (Original) The diplexer of claim 14 wherein said high-pass filter comprises:

a plurality of capacitors connected in series between said first and second signal ports, each of said capacitors being coupled to ground via serially coupled circuit elements forming thereby a plurality of single pole filter elements, each of said serially coupled circuit elements comprising a capacitor and inductor.

17. (Cancelled)

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18. (Currently Amended) The diplexer of claim 17 14, wherein the selector digitally operable switch comprises at least one switch is selected from the group consisting of PIN diodes, and transistors, and electro mechanical switches.

19. (Currently Amended) The diplexer of claim 15, wherein the selector digitally operable switch comprises:

a plurality of PIN diodes respectively coupled in parallel with said second plurality of inductors, wherein said PIN diodes are adapted for connection to a control signal from the microprocessor for selectively biasing the PIN diodes to couple and decouple the resonator-free, non-resonator-actuated notch filter to the low-pass filter.

20. (Currently Amended) A method of passing bi-directional communications signals of differing modes through a diplexer having a high-pass filter coupled between a first and a second signal port, a first low-pass filter selectively coupled to a resonator-free, non-resonator-actuated notch filter, said low-pass filter coupled between the first and a third signal port, comprising:

- receiving downstream signals at the first signal port;
- filtering the received downstream signals using said high-pass filter;
- communicating filtered downstream signals to the second signal port;
- receiving upstream signals at the third signal port;
- receiving a control signal from a microprocessor in response to desired communication mode;
- controlling a digitally operable switch to selectively coupling couple said resonator-free, non-resonator-actuated notch filter to the low-pass filter for filtering the received upstream signals in response to a desired communications mode the received control signal from the microprocessor; and
- sending the filtered signals to the first signal port.

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21. (Previously Presented) The device of claim 1, wherein said notch filter comprises a plurality of inductors and a plurality of pin diodes, each of the plurality of inductors having a first end and a second end, each of the plurality of inductors connected in parallel with a respective one of the plurality of pin diodes at the first end and a common control node at the second end.

22. (Previously Presented) The diplexer of claim 14, wherein said notch filter comprises a plurality of inductors and a plurality of pin diodes, each of the plurality of inductors having a first end and a second end, each of the plurality of inductors connected in parallel with a respective one of the plurality of pin diodes at the first end and a common control node at the second end.